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SOME NOTES ON THE ANATOMY OF THE HUMP IN THE SHORTHORNED ZEBU

A. H. MILNE

VETERINARY LABORATORY, MPWAPWA, TANGANYIKA TERRITORY

A.—CONFORMATION AND STRUCTURE OF THE HUMP

The hump of the Shorthorned Zebu is a prominent structure, situated dorsal to the vertebral border of the scapular cartilage. Both in size and in shape it varies in different animals, and, in the same animal, at different times. From its cranial extremity the hump rises at an angle of about 45° to a rounded summit, when it descends at a varying acute angle to its caudal extremity. The somewhat dome-shaped summit of the hump is frequently pendulous, lying over the caudal extremity of the hump. This mobility is due to the fatty nature of the hump, the base of which, however, is securely attached.

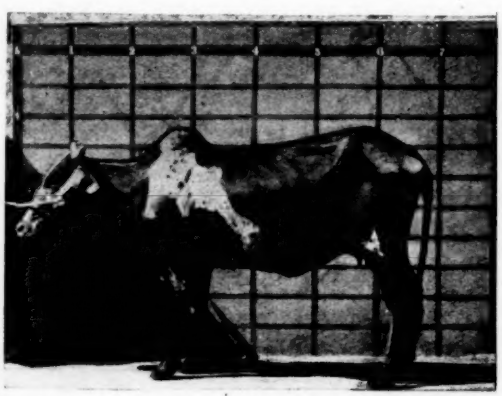


FIG. I: Shorthorned Zebu Cow.

The hump is closely associated with two muscles, the Trapezius and the Rhomboideus.

M. Trapezius

1. In animals which do not possess humps, this muscle is somewhat fan shaped, and is not clearly separable into cervical and thoracic portions. It takes origin from the ligamentum nuchae and the supraspinous ligament, from the level of the atlas to the 10th to 12th thoracic vertebra. It is inserted into the spine of the scapula. The cranial border of the muscle in its proximal half is adherent to the dorsal portion (m. cleidooccipitalis) of the m. brachiocephalicus. In its distal half the cranial border is adherent to the m. omotransversarius.

2. In the Shorthorned Zebu we find that this muscle is clearly defined into cervical and thoracic parts. The thoracic part is thicker and more strongly developed than the cervical part, and is noticeably darker in colour.

The cervical part, which is thin and of a light reddish brown colour, is closely associated with the hump, and as pointed out by Curson and Bisschop[1], may be regarded as a cranio-lateral attachment to the hump. This would undoubtedly appear to be the case, as when this muscle is severed in the newly-killed animal, the hump tends to relax caudally, and presents a different appearance from that in the living animal.

The thoracic portion is, as stated above, well developed. Cranially, a portion of the muscle is attached to the posterior part of the hump, but although sometimes quite strongly developed, this slip of muscle would not appear to have much part to play in the anchorage of the hump.

M. Rhomboideus.

1. In unhumped animals this muscle may be divided into thoracic and cervical parts. The muscle takes origin from the ligamentum nuchae, and the supraspinous ligament, and it is inserted into the medial surface of the scapular cartilage. The cervical part is narrow, and is pointed at its anterior extremity. It lies along the funicular portion of the ligamentum nuchae and is attached to it by short tendinous bundles. The fibres of this part are arranged more or less longitudinally.

The thoracic portion is roughly quadrilateral in shape, and the fibres are disposed in an almost vertical direction. The deep face of this part of the muscle is closely attached to the dorso-scapular ligament.

2. The modifications in this muscle in the Shorthorned Zebu are extreme. The cervical part, with its longitudinally arranged fibres, has entirely disappeared and we find remaining a well-developed muscle, the fibres of which run more or less ventro-caudally, and which forms not only a foundation but also a muscular basis or framework for the fatty hump. Curson and Bisschop consider this muscle to be the anterior portion of the thoracic part of the m. rhomboideus, greatly developed, and they therefore describe the hump as "a musculo-adipose development of the m. rhomboideus pars thoracalis (anterior portion)."[2] However, as they themselves point out, it is equally possible to consider the hump as development of the posterior part of the cervical portion of the m. rhomboideus; but in any case the hump in the Shorthorned Zebu would undoubtedly appear to be a development of the modified m. rhomboideus found in that animal.

B.—THE HUMP IN RELATION TO THE BONES OF THE VERTEBRAL COLUMN

1. During this last year (1940) I have had the opportunity of examining a great number of animals of the

Shorthorned Zebu type, which were being slaughtered for rinderpest vaccine production. The humps in these various animals varied greatly in size and shape.

A study was made to determine the relationship of the hump to the bones of the vertebral column.

It was found that in the great majority of cases the cranial extremity of the hump lay over the 1st thoracic vertebra, whilst the caudal extremity lay over either the 4th or 5th thoracic vertebra.

In several cases the cranial extremity of the hump lay definitely over the 7th cervical vertebra.

In no case did I find a hump which extended caudally further than the 6th thoracic vertebra and cases of humps extending to that vertebra were rare. A photograph is given showing a hump which extended from the 7th cervical to the 6th thoracic vertebra.

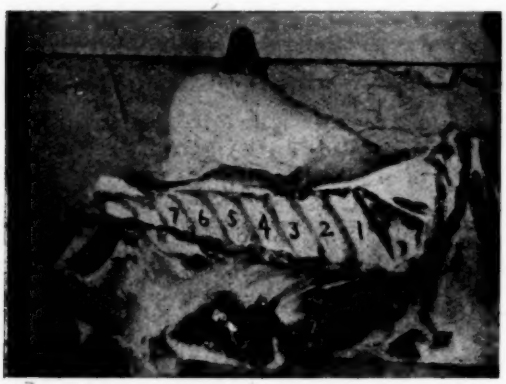


Fig. II: Dissection showing the hump in relation to the underlying bones.

These findings are not in agreement with the statement of Curson and Bisschop[3] that the hump in the Shorthorned Zebu lies over the 1st to the 9th thoracic vertebrae.

2. At the Vaccine Laboratory at Mbozi, which supplied the needs of the extensive rinderpest campaign in this territory during 1940, Longhorned cattle without obvious humps occasionally presented themselves for examination.

Opportunity was therefore taken to determine whether or not the spinous processes of the vertebrae related to the hump in the Shorthorned Zebu differed in relative length from the corresponding vertebrae of these Longhorned cattle.

The method of determination adopted was to plot a series of graphs representing the curve formed by the tips of the spinous processes of the 7th cervical to the 4th thoracic vertebrae in various Shorthorned Zebus and Longhorned cattle without obvious humps.

The vertebral column, from the 7th cervical vertebra to the 4th thoracic vertebra, was removed from the carcase and freed as far as possible from flesh by dissection and subsequent boiling in water. The vertebrae were not separated but were allowed to remain articulated. The cartilages on the tips of the spinous processes were, however, removed.

A large sheet of drawing paper was pinned down on a flat table and the portion of the vertebral column was placed upon it, resting on the transverse processes and the tips of the spinous processes. The ventral border of the vertebral bodies was approximated to the straight line, which was one border of the sheet of paper. The highest point of each spinous process, this being in practically every case the cranial angle of the proximal extremity, was then marked on the paper with a pencil and the portion of vertebral column was removed.

Perpendiculars were then drawn from these points to the border of the paper along which had been approximated the ventral border of the bodies of the vertebrae, and the height of each was measured. The distance between each perpendicular was also measured. The process was repeated and an average of each measurement taken.

Measurements were obtained in a similar way from a series of cattle, and the necessary data required to plot graphs—for comparative purposes—of the curves formed by the tips of the spinous processes of the vertebrae from the different animals were thus obtained. To render the graphs of a convenient size, the figures obtained were in each case divided by four and taken to the nearest point place of decimals.

Data were obtained from eight Shorthorned Zebu type animals and from four of the Longhorned cattle. Graphs were constructed for each animal.

A study of these graphs showed that, although the curves obtained from the Shorthorned Zebu animals and from the Longhorned animals differed amongst themselves to a certain extent, the curves from the Shorthorned Zebus all rose fairly acutely from the 7th cervical vertebra and conformed more or less to the shapes of the humps. In contrast, the curves obtained from the Longhorned animals represented a gentle rise from the 7th cervical vertebra and showed no hump-like shapes.

It would appear, then, that the spinous processes of the vertebrae related to the hump in the Shorthorned Zebu when compared with the spinous processes of the same vertebrae in the Longhorned cattle without obvious humps are found to be altered in their relative lengths to conform to the shape of the hump.

The average measurements obtained of the heights of the spinous processes for each vertebra over the whole series of Shorthorned Zebu and Longhorned cattle are given in the following table :—

Table

Type of Animal	Serial Number of Vertebra				
	C7	Th. 1	Th. 2	Th. 3	Th. 4
	cm.	cm.	cm.	cm.	cm.
Shorthorned Zebu ...	6·0	9·8	10·2	10·3	9·3
Longhorned without obvious hump	6·8	9·2	9·0	8·9	8·1

Acknowledgments.—I am indebted to Dr. M. H. French for the photograph of a hump which accompanies this paper, and for his kindness in confirming some of the observations on the bony relations of the hump.

My thanks are also due to the Director of Veterinary Services, Tanganyika Territory, for the photograph of a Zebu cow and for his permission to publish this paper.

References

[1] Curson, H. H. and Bisschop, J. H. R. (1935.) Some Comments on the Hump of African Cattle. *Onderstepoort J. Vet. Sci. and Anim. Indust.* **5**. No. 2.
[2] ——. *Ibid.*
[3] ——. *Ibid.*

An Experiment with Phenothiazine

D. W. KERRUISH, M.R.C.V.S.,
Douglas

During the autumn of 1940 eighteen lambs were purchased for the purpose of carrying out an experiment to determine the value of phenothiazine when administered to fattening lambs.

The lambs were of the 1940 spring crop and had been rejected by the graders as ineligible for any of the three fat stock grades. They came from different flocks and from different parts of the Isle of Man. The majority were single lambs out of bunches which had been passed by the graders. All were full grown so that any increase in weight was due almost entirely to an increase in the quantity of flesh.

The lambs were divided into two lots of nine and numbered 1 to 18, weighed singly.

Numbers 1 to 9 inclusive were treated as controls and numbers 10 to 18 inclusive were each given 10 grammes of phenothiazine in tablet form. All the lambs were then turned on to the same pasture. The lambs were weighed singly each week over a period of eight weeks and again at the end of the eleventh week.

Hand feeding was commenced at the end of the fourth week. One of the experimental lambs unfortunately had to be castrated on the day the experiment commenced in order to comply with the provisions of the Castration of Ram Lambs Order. This lamb did not thrive as well as did other members of the group. In spite of this the total weekly weight of the experimental lambs showed a steady gain on the total weekly weight of the control group.

The total weights of the control group did not show a steady weekly increase in weight comparable to that of the experimental group, and at two periods (1) the week prior to the commencement of hand feeding, practically no weekly increase in weight is shown and (2) the week prior to their receiving 5 grammes of phenothiazine a loss in weight occurred. The control animals received 5 grammes of phenothiazine at the end of the eighth week with a view to marketing them at the end of the experiment. The immediate response shown by a total increase of weight of 42 lbs. in three weeks is significant. Both groups of lambs were presented for grading on the same day. The control group were graded three in first grade (estimated killing-out percentage 49 per cent. of live weight) and six in second grade (estimated

Table I

No.	Description.	Initial Weight Lbs.	Weekly Weight in Lbs. 1	2	3	4	5	6	7	8	9	10	11	Gain in Lbs.
Controls. (Not initially dosed.)						*				†				
1	Ewe—K.D.D. X ...	80	80	86	86	87	94	96	96	93			94	14
2	Wether—C.L.S. X...	90	94	94	94	96	96	98	100	101			110	20
3	Wether—D.D. X ...	96	94	99	102	102	106	107	107	105	Not weighed	Not weighed	112	16
4	Ewe—K.D.D. X	70	72	72	72	71	75	78	80	82			87	17
5	Wether—C.L.S. X...	110	114	120	116	116	117	120	120	116			124	14
6	Wether—S. X ...	78	78	80	84	83	83	81	83	88			90	12
7	Ewe—Sc.L. X ...	78	78	81	90	87	87	88	88	88			90	12
8	Wether—S.L. X ...	74	80	81	81	83	85	90	90	88			94	20
9	Ewe—C.L. X ...	80	88	88	88	89	90	90	93	92			94	14
		756	778	801	813	814	833	848	857	853			895	139

Average gain per lamb = 15 lbs. 7 ozs.

No.	Description.	Initial Weight Lbs.	Weekly Weight in Lbs. 1	2	3	4	5	6	7	8	9	10	11	Gain in Lbs.
Dosed Lambs. (Initial dose of 10 grammes and dose of 5 grammes at 8th week.)														
10	Wether—K.D.D. X	80	82	84	82	89	90	92	93	95			102	22
11	Wether—K. X ...	82	90	92	94	98	100	100	100	103			106	24
12	Wether—Sc.L. X ...	82	88	92	96	95	102	104	104	108			114	32
13	Wether—D.H. X Castrated 17/10/40	96	92	96	99	103	104	106	106	108	Not weighed	Not weighed	114	18
14	Ewe—C.L.S. X ...	90	94	94	95	99	103	102	104	102			102	12
15	Wether—S. X ...	94	94	98	98	99	102	106	108	108			112	18
16	Wether—S. X ...	77	82	82	86	89	92	92	94	95			102	25
17	Ewe—S.L. X ...	54	60	62	64	66	68	68	70	69			74	20
18	Wether—S.C.L. X...	90	94	96	98	98	100	102	104	106			108	18
		745	776	796	812	836	861	872	883	894			934	189

Average gain per lamb = 21 lbs.

* Hand feeding commenced.

† Dosed with 5 grammes of phenothiazine to improve sale value.

C. = Cheviot; D.D. = Dorset Down; D.H. = Dorset Horn; K. = Kerry; L. = Leicester; Sc.L. = Scotch Leicester; S. = Suffolk; X = Cross.

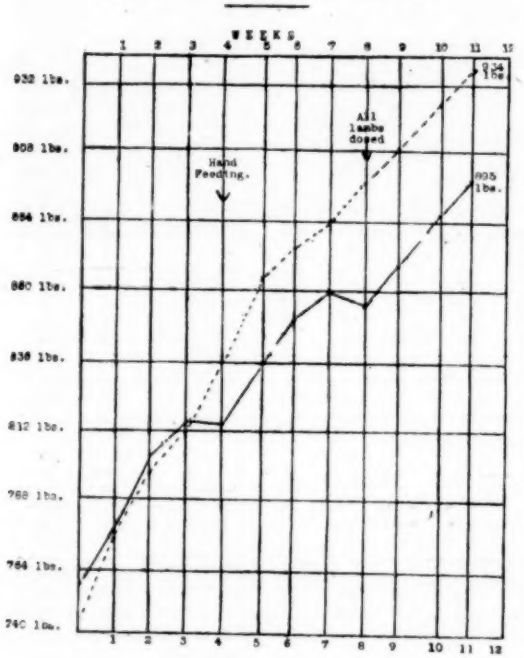
killing-out percentage 45 per cent. to 48 per cent. of the live weight). The experimental group were graded seven in first grade and two in second grade. It was intended that the dead weights of all these animals should be obtained but unfortunately only six of the dead weights of the first grade animals in the experimental group were obtained.

These animals showed an average dead weight of 50·5 per cent. of the live weight.

Conclusions

On the evidence of the accompanying graph showing the total weekly weights for the two groups of lambs, phenothiazine is of considerable value in fattening lambs, enabling them to be fattened more easily and more rapidly. Although none of the experimental or control animals showed clinical signs of worm infestation the routine administration of phenothiazine to fattening lambs would be of considerable benefit.

Graph showing total weights of lambs treated with Phenothiazine at the Knockalee Experimental Farm.



Weekly Wisdom

When Heaven demands of a man great work in this world, it makes his heart ache, his muscles weary, his stomach void and his mind disappointed; for these experiences expand his heart to love the whole world and strengthen his will to battle on where others fall by the way.—(Chinese.) Mencius.

CLINICAL COMMUNICATION

Suspected Poisoning from Salvaged Soya Bean Meal

A. J. E. NEEDHAM, M.R.C.V.S.
Ashbourne, Derby

On the night of March 18th, 1941, I was called to examine a Red Shorthorn cow, one week off calving, which, according to the owner, was "having a fit."

Examination of the animal revealed the following symptoms: salivation, laryngeal paralysis, blindness, staggering gait, and muscular twitchings affecting the back and neck. The temperature was normal, and a quantity of faeces passed at the time of examination was extremely hard and dark in colour. Except for the constipation, which had been present for at least three days, symptoms had been fairly rapid in onset, the animal having been normal at milking time that evening.

Although I had not previously seen acetonaemia in a down-calving cow, a tentative diagnosis of this disorder was made. A purgative was administered and a sample of milk taken for chemical test: this proved negative.

The animal died at 10 a.m. on the following morning in convulsions.

On the evening of March 19th the same owner reported that another cow was affected similarly, and I examined this with my principal, Mr. C. J. Peach. Symptoms were identical with those seen in the previous case.

When questioned as to what diet the animals had received, the owner stated that they had had a fodderring of hay in the morning, one of oat straw at night and, during the day, concentrates, consisting of beet pulp, compound dairy cake and, up to ten days previously, 2 lb. per head of salvaged soya bean meal. This diet appeared to be suitable as all the animals were in excellent condition, and as regards the last-named material it was impossible to say whether or not this was the cause of the trouble. On the other hand, this farm was to our knowledge subject to mineral deficiency. It was therefore decided to try calcium gluconate by injection and 5 oz. of the drug, dissolved in 20 oz. of water, was injected. The sight returned rapidly, and in about 20 minutes the animal was steadier on its feet.

When seen the following day progress was maintained and she had eaten a little hay, but was showing severe clonic spasms of the muscles of the back and neck, so that food had to be placed in a crib about shoulder high, otherwise the sudden jerking upward of the head made it impossible for the animal to feed. Magnesium lactate, ½ oz., dissolved in 10 oz. of water, was injected intramuscularly, and a draught of ol. lini, one pint, with 1 oz. ol. tereb. given.

On examining the remainder of the herd, another cow was seen to have commenced the characteristic salivation with head raised and making continual chewing movements with the jaws. Calcium and magnesium therapy was applied, but on the following day, March 22nd, it had become much worse and was slaughtered.

On Sunday, March 23rd, the owner reported that two more cows were ill and he was getting anxious lest the entire herd should become affected. Up to

now, of three cases treated two had ended fatally so that the prospect of two more potential losses prompted us to suggest that another opinion should be sought. The owner agreed, and that morning Mr. E. Marrison very kindly attended without delay.

A part-bred Ayrshire heifer was showing typical symptoms, while an Ayrshire cow had gone off its feed and was severely constipated, though showing no other symptoms.

We now had an opportunity to make a *post-mortem* examination of the animal which was slaughtered the evening before. Except for a patchy inflammation of the abomasum there was nothing spectacular to see, but it seemed evident that some toxic agent was being absorbed through the gastro-intestinal tract and in consequence treatment was designed both to eliminate the cause and to prevent further absorption.

One pint ol. ricini was administered, followed four to six hours later with chlorodyne, sodii bicarb., creta praep. and " Carbo-Pulbit ", as an adsorbent, in suitable dosages.

This line of treatment proved most satisfactory and no more deaths occurred.

A second outbreak developed at a farm several miles from the previous cases. Symptoms were identical and, what was most interesting, the diet had contained salvaged soya meal up to ten days before. Calcium therapy, together with similar medicinal treatment, again proved successful.

A third case occurring as a single instance came to our notice at another farm. This animal recovered spontaneously, but it was definitely established that it had received a quantity of soya meal.

Observations.—While not attempting to diagnose the disorder definitely as being due to salvaged soya meal, it is interesting to note that :—

(1) All cases had received a quantity of this material in the diet.

(2) The toxic effect did not become manifest for some considerable time, as in all cases the material had been discontinued before symptoms developed.

(3) In the original outbreak some lying-off beasts had received in excess of 2 lb. per day of the meal and yet were never affected, while the down-calving cows had been made seriously ill.

At the invitation of the Department of Agriculture for Scotland, deer forest owners attended a meeting in St. Andrew's House, Edinburgh, to discuss arrangements for the killing of deer and the disposal of the venison during the coming season. In this connection, the Department had prepared a statement showing that the number of stags and hinds returned as killed during the season 1940-41 is over 4,000 higher than the number reported as killed during the previous season, and nearly 10,000 over the average estimated pre-war season's kill. The total number killed is 22,543.

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Farmers are complaining at the amount of meat which is being condemned when they take casualty stock to the local slaughterhouse. North Lindsey F.U. urges that no meat should be condemned except by a qualified meat inspector appointed by the local authority.—*Farmer and Stockbreeder.*

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The value of livestock on farms of the U.S.A. on January 1st, 1941, was £1,342,268,500, compared with £1,299,747,250 at the same date in the previous year.

ABSTRACTS

[OBSERVATIONS ON CONTAGIOUS ABORTION IN A RECENTLY INFECTED HERD. Haupt, H. (1940.) *Arch. Tierhlk.* **75**. 20.]

Following the occurrence of contagious abortion in a cow in a dairy herd, the disease spread rapidly so that 19 animals aborted within eight months of the appearance of infection. Although the herd appeared to be newly infected, it was impossible to control the spread of infection by segregation and blood testing. Since the agglutination test failed to disclose a positive reaction at the time of abortion it is suggested that a titre as low as 1 : 25 be regarded as significant. It is recommended that foetal lung be used for cultural examination for the presence of *Br. abortus* since there is some evidence that they are most frequent or numerous in this site.

S. J. E.

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[SYMPTOMS AND LESIONS IN CATTLE PRODUCED BY TRICHOMONADS. Zeller, K., and Schaaf, J. (1940.) *Arch. Tierhlk.* **75**. 29.]

The authors record the results of studies on the artificial infection of cattle with trichomonads. Seventeen cattle and one bull were infected by one or other of the following methods—intravenously, by injection into the vagina or prepuce and by infection at service by an affected bull. In most cases the parasites established themselves in the mucous membrane of the uterus or vagina and they were present in cultures from these sites up to ten months after infection. Infection with trichomonads was usually accompanied by the following symptoms—abortion, sterility and metritis. It was found that simultaneous injection with the virus of contagious vaginitis did not influence the course of the disease. Trichomoniasis may assume a latent course, and the conditions responsible for the development of the clinical state are probably dependent on the constitution of the animal. The parasite may be demonstrated by microscopic or cultural methods, but in bulls these may fail and reliance should be placed by the results of service in clean cows.

S. J. E.

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[THE BEHAVIOUR OF *BRUCELLA ABORTUS* ANTIGEN IN VARIOUS EXPERIMENTS. Eichhorn, A., Mingle, C. K., and Murdock, F. M. (1940.) ***Amer. J. vet. Res.*** **1**. 3-17. (10 tables, 7 refs.).]

Previous reports by Continental observers [Dubois, C. (1938), ***Bull. Acad. vet. Fr.*** **11**, 383, and Cordier, C. (1938), ***Rev. Med. vet. Toulouse,*** **90**, 481] have suggested that living Brucella organisms incorporated in certain excipients will remain localised at the site of injection and will fail to set up carrier animals.

The experiments described in this paper were designed primarily for the purpose of studying the action of various excipients* on living *Br. abortus* suspended in them. Relative values were determined on the basis of direct comparison with 0·85 per cent. saline.

* The following were the excipients studied: 2, 4 and 6 per cent. cholesterol in oil of sweet almonds or liquid paraffin; 1 and 2 per cent. saponin in saline; 10, 25 and 50 per cent. lanolin in liquid paraffin; oil of sweet almonds; liquid paraffin.

In vitro tests showed that certain excipients were highly bactericidal, while others had little action, *e.g.*, a 50 per cent. lanolin in liquid paraffin suspension of organisms became sterile in 96 hours whereas in liquid paraffin the organisms remained viable for many months.

In vivo experiments carried out on cows, steers and rabbits demonstrated that Brucella organisms suspended in physiological saline may remain at the site of inoculation (subcutaneous) for up to 85 days. This persistence may be increased up to 150 days by the use of 2 per cent. cholesterol in liquid paraffin as the excipient. Variation of the type of excipient did not appear to have any significant effect on the agglutinin response.

A strain of lowered virulence (Strain 19) was used throughout the experiments, and it was found that ten cultures recovered from the subcutaneous tissues between the 59th and 97th days after inoculation had not had their virulence enhanced in any way.

The authors, basing their conclusion on the theory that increased immunological response may be induced by retarded antigen absorption, suggest that 2 per cent. cholesterol in liquid paraffin has shown sufficient promise to justify further study.

J. S. P.

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[THE TOXIN OF *CORYNEBACTERIUM OVIS*. Carne, H. R. (1940.) *J. Path. Bact.* **51**. 199. (3 tables, 1 fig.).]

This paper is a continuation of a previous communication dealing with the general characteristics of strains of *C. ovis* of Australian origin. Marked differences in toxigenicity were noted amongst the 200 strains examined, although all were toxigenic. The various technical details regarding media, atmospheric conditions, temperature and filtration are described. Filtration removed much of the toxin from some batches and was therefore discarded. After centrifugalisation of the toxic broth, the supernatant fluid was sterilised, usually within 48 hours, by the addition of toluol, which formed a layer on the surface and therefore helped to prevent oxidation.

The author's method of concentration and desiccation of the toxin is well described. The toxin is fairly stable provided oxidation is prevented. It can be converted into toxoid with formalin. Most of the large and small laboratory animals are susceptible to *C. ovis* toxin, but to varying degrees. No ill-effects were noted after administration *per os*. Specific antitoxin was produced in artificially infected animals and could also be demonstrated in the blood of naturally infected sheep. Antitoxin was also produced in a horse by means of formol-toxoid. The possibility of developing a diagnostic test in sheep comparable with the Schick (diphtheria) test in man was investigated, but it was not accurate enough for practical purposes.

J. S. P.

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[THE ROLE OF THE MUSCULATURE IN LOCAL TETANUS IN THE HORSE. Deuthold, A. (1940.) *Schweiz. Arch. Tierhlk.* **82**, 43-55.]

In 1929 the author saw many cases of tetanus localised in the muscles of the neck in horses given an excessive dose of anatoxin. He later experimented on horses to find whether it is possible to produce genuinely localised tetanus in horses by injections of ordinary toxin.

Natural local tetanus in horses is very rarely seen (four cases are cited), but is common in horses being hyperimmunised for antitoxin production.

Ten horses destined for slaughter were given single doses of broth culture filtrate in amounts reckoned as from one-fiftieth to five m.l.d. for horses by injection into the muscles at the back of the thigh, whilst one horse received one-sixth m.l.d. in the coronet of a hind leg.

In almost all the former group local tetanus developed and was followed by generalised tetanus after a period. The horse injected in the coronet developed generalised tetanus only. One horse given one-sixth m.l.d. intramuscularly developed local, then general tetanus, and recovered from these manifestations in the reverse order.

Deuthold explains these results by supposing that tetanus toxin injected into muscles acts first on the end plates of the motor nerves therein and later reaches the central nervous system by way of the axis cylinders of the nerve trunks.

Local tetanus of the hind limb showed itself merely as a form of "hanging leg" lameness (stiffness and difficulty in advancing the limb) together with local hardness on palpation.

Tetanus from infection low down on the legs would be expected to result in generalised tetanus, signified by symptoms of the head, and this is probably the rule in practice.

J. E.

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[FELINE PELLAGRA. Heath, M. K., MacQueen, J. W., and Spies, T. D. (1940.) *Science.* **92**. 514.]

The authors have encountered six cases of a deficiency disease in cats which responded promptly and dramatically to daily oral doses of from 80 to 100 mg. of nicotinic acid. Each of the animals lost weight and refused food, and at the time of examination was dejected and sluggish in appearance, making no effort to move when prodded or to resist physical manipulations such as forcibly hyperextending the jaws. The tongue was reddened at its terminal portion, and there was an ulcerated margin close to the midline of the upper palate. Thick and offensive saliva drooled from the mouth. In each case there was a rise in temperature of from 3° to 5° F.

Within 48 hours of the commencement of nicotinic acid therapy there was a return of appetite, a disappearance of the oral lesions, and a fall in temperature to normal. One case history is given in full.

A. N. W.

"BREED EVERY MARE"

An appeal to all owners of Suffolks to breed every mare was made by Sir Cuthbert Quilter, when he was elected President of the Suffolk Horse Society at the recent Council meeting, at which he asserted that those who did so would find a certain demand in the near future. It was predicted that every horse that could be spared off the farms when the war was over would be wanted, particularly for transport work in towns. Already big commercial undertakings that had been using mechanical power were reverting to horses. Sir Cuthbert added, "We must keep breeding horses to be in a position to take advantage of the markets after the war—not that there is much to complain of now, as the wonderful sales of Punches this year bear witness."

REVIEW

[RECENT ADVANCES IN SEX REPRODUCTIVE PHYSIOLOGY. By J. M. Robson. Second Edition. (Pp. 329; 62 illustrations, 15s.). London: J. & A. Churchill, Ltd. 1940.]

Numerous advances have been made since the first edition of this book was published, and the author has succeeded in giving an excellent summary of the literature on the subject. A useful feature is the marking of the more important references by an asterisk.

Much more is now known about the androgens, and there is a close chemical relationship between them and the oestrogens, progesterone and the hormones of the adrenal cortex. It is clear that the male sex hormones are not confined to the male but also occur in the female and vice-versa. Knowledge is accumulating on the quantitative relationships which are necessary between oestrin and progesterone and also between the follicle stimulating and luteinising hormones of the anterior pituitary for proper physiological function. The hormonal control of the mammary gland is becoming more clearly understood.

There is a chapter on the standardisation of the sex hormones and another on their clinical application. The latter contains a useful table of all the sex hormones, the route of administration and their action. It is now known that the same hormone may produce different results in different species and also in the same species when the dose is varied.

It is obvious that much fundamental knowledge is still required before we understand the normal reproductive processes and the hormonal factors which lead to sterility in farm animals. This book, of necessity, contains much information of a comparative nature, and it is to be hoped that it will stimulate work on this aspect of sterility in veterinary institutions throughout the country.

REORGANISATION AT THE MINISTRY OF FOOD

Lord Woolton has introduced a considerable number of changes in the organisation of the Ministry of Food. The commercial services in the Department have been reorganised and the distinction between trade staff and the Civil servants has disappeared. The commercial services are being run by commercial men, who are the heads of the departments, and who have definite responsibility placed upon them both for the supply and the distribution of the commodities within their scope. In order to co-ordinate under the head of the supply divisions the work of the various sections, there is an administrative grade of principal assistant secretaries most of whom have had experience in commercial administration outside of Government departments.

Mr. J. F. Bodinnar, the commercial secretary of the Ministry, has been appointed head of the supply department, which comprises all the commodity divisions. He is assisted by five senior administrative officers who are chiefly concerned with questions of policy and matters affecting other Government departments, *e.g.*, the Treasury. No alteration has been made in the existing arrangements in the meat and livestock division, the cereals division, and the division which deals with fruit, vegetables and potatoes.

The numerous commodity divisions include that for animal feeding-stuffs, with Sir Bryce Burt as director.

IN PARLIAMENT

Lords Debate Food Production

In the House of Lords on May 21st, Earl de la Warr asked the Government about the progress of the campaign for increased food production, and moved for papers. He said that already 4,000,000 acres of grass land had been ploughed up, thousands of miles of ditches had been cleaned, and great distances of hedges cut. This was a record of which both the Ministry of Agriculture and the farmers might be proud.

We were told that in the next 12 months we must plough up another 1,000,000 acres; yet at the same time that after the harvest there would be a further call-up of farm workers. If we wanted the food the position could not be left as it was. He suggested that an agricultural labour corps should be formed, consisting of boys between 18 and 20, who were waiting to be called into the Forces, of older men of the type mentioned the other day by the Minister of Labour, and of those existing agricultural workers who might be able to be spared from particular farms, though not from food production. Such a force could be placed at the disposal of the war agricultural committees and allocated by them to work that would produce the maximum of food.

Lord Bingley said there would be years of shortage of food after the war was over, and increased production of food was of great importance. The allotment movement was of the utmost value.

Viscount Bledisloe said that there would be increased confidence if there were co-ordination, or even a merger between the Departments of Agriculture and Food. Too much stress was being laid on the merits of the indiscriminate ploughing up of pasture land for immediate food production. It would lead ultimately to soil exhaustion. What was going to be the position in 1942 or 1943 if the war lasted so long? He emphasised the need for expert advisers to be available to farmers in every part of England. Farmers should be exonerated from the unnecessary task of filling up so many forms.

Lord Brocket said it was very important that the Government should now devote themselves to consideration of a long-term policy for agriculture after the war.

Lord Gainford stated that there was every prospect of the transport system of this country being maintained adequately in order to help the conveyance of basic slag. He laid special emphasis on the importance of land drainage.

Lord Cornwallis paid a tribute to farmers, who, however, still had not got confidence that they would not again be let down by politicians.

Lord Addison said it was a mistake to concentrate too much on the mere ploughing up of additional grass. There was a great deal of indifferent farming. To bring more land into cultivation next year it would be necessary to employ now 10,000 to 20,000 more men on draining the land.

Government Reply

The Duke of Norfolk, Joint Parliamentary Secretary to the Ministry of Agriculture, said that the objective of ploughing up 3,750,000 acres by the spring had been achieved, and in addition between 100,000 and 150,000 acres of derelict or semi-derelict land had been brought back into cultivation. The question of labour was a source of worry to the farmer, to the Department, and also to the Minister of Labour. The farmers would agree that a proportion of the Armed Forces must be provided from those who worked on the land, and a certain number of men would still have to be taken from agriculture.

The creation of a large pool of labour had been the objective of the Ministry for some months past. They had 3,000 civilians at work now, and by arrangement with the War Office 3,000 pioneers were at the temporary disposal of the county committees. It was hoped in the near future to have available some 10,000 men for gang labour, from men now being required to register for

employment and those being de-reserved from scheduled occupations. Accommodation would be found for them in camps. The prisoners of war it was hoped to have in the near future would be accommodated in large camps. They would need armed guards, and there were only certain areas in the country where they would be allowed to operate. By the late autumn it was hoped to have increased the labour gangs from the present 6,000 to 15,000 men.

Schools had arranged to stagger their holidays to assist the harvest, and the universities had undertaken to find volunteers from the undergraduates. The Women's Land Army was over 11,000 strong, and another 1,100 were in training. Nearly 90,000 tractors—an increase of 60 to 70 per cent. since the war began—had been provided. To ensure that all machinery was most effectively used more co-operation was needed among certain farmers.

Obviously as many animals as could be fed must be kept, but useless and bad animals were possibly a greater discredit than credit to some of the herds. If these were got rid of we ought to be able to kep some 75 per cent. of the livestock as it was to-day. Post-war agricultural policy was always under consideration by the Ministry.

He was convinced that the war agricultural committees were doing really good work. Those on the land were more than pulling their full weight, but there was no complacency in the Ministry or elsewhere. There was no sacrifice which farmers, with a certain amount of encouragement, would not make to produce the food required. (Cheers.)

The motion was, by leave, withdrawn.

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The following are among the questions and answers recently recorded in the House of Commons:—

Feeding-stuffs

Mr. Wootton-Davies asked the Parliamentary Secretary to the Ministry of Food whether he is aware of the difficulties and anxiety of those keeping light utility horses for driving, riding and miscellaneous agricultural and transport work in country and town; that the authorities responsible for administering the rationing scheme locally are not aware of how the various horses are to be categorised; and whether he will issue a full statement of the intentions and *modus operandi* of the horse-rationing scheme?

Major Lloyd George: I am not aware of the difficulties referred to. Instructions have been issued to the County War Agricultural Executive Committees, which are responsible for issuing coupons for horses on agricultural holdings, and to local food offices which are responsible for other horses. I am sending further particulars to my hon. Friend. If any horse-owner is in difficulties with regard to the supply of rationed feeding-stuffs for his horses, he should apply to the appropriate authority.

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Animals (Illicit Slaughtering)

Mr. J. Griffiths asked the Parliamentary Secretary to the Ministry of Food whether he is aware of the increase in the illicit slaughtering of animals taking place, with the consequent evasion of meat rationing, and the waste of by-products which are buried; and what steps he is taking to prevent this practice?

Major Lloyd George: I am aware that a certain amount of illicit slaughtering of animals is taking place. Inquiries are made into all cases where the Ministry's officers have reason to suspect that this type of offence is being committed, and proceedings are taken where the necessary evidence is available. The number of prosecutions for illicit slaughtering in March was 100 compared with only 18 in November last.

Mr. Griffiths: Has the inspectorate been increased for the purpose of stopping this practice which takes place in rural areas and by which, it is alleged, well-to-do people can substantially increase their meat ration?

Major Lloyd George: I cannot answer that supplementary question without notice.

Mr. Lipson: Is the number of inspectors adequate?

Major Lloyd George: I should like to have notice of that supplementary question.

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Fat Stock (Grading)

Mr. R. Morgan asked the Parliamentary Secretary to the Ministry of Food whether, in view of the dissatisfaction with the existing arrangements, he will make it possible for a farmer who may so desire, to sell livestock on the actual killing-out weight, as bacon pigs are sold?

Major Lloyd George: I am not aware of any widespread dissatisfaction with the existing arrangements for the grading of fat stock in collecting centres, and the reports received by the Ministry show that the grading is being carried out generally in a satisfactory manner. The proposal to grant farmers the option of having their cattle and sheep graded on the basis of their actual carcase weights has already been carfully considered, but it has not been found practicable to adopt such an arrangement.

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Meat

Mr. De la Bere asked the Parliamentary Secretary to the Ministry of Food whether he is aware that, in view of the price obtainable for meat classified as unfit for human consumption which is provided for dogs and for which up to 1s. 4d. per lb. is obtainable, some farmers find it more profitable to classify their animals as unhealthy and so obtain a better price than by selling them for human consumption; what method he proposes to adopt to deal with this; and whether he will consider improving the prices of animals that are sold for the purpose of providing meat for human consumption?

Major Lloyd George: I am aware that dogs' meat is being sold to owners of dogs at high prices and that some cows which might be fit for human consumption may be finding their way to knackers yards for this trade. Measures to prevent any abuse of this kind are at present being examined. In reply to the last part of my hon. Friend's Question, the prices of lower grade cows have recently been increased.

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Patent Medicines (Taxation)

Mr. Keeling asked the Chancellor of the Exchequer whether he is aware that his predecessor when withdrawing, in response to the views of this House, his proposal to discontinue the taxation of patent medicines, promised to re-examine the question of continuing to tax them, and repeated this promise to a deputation of hon. Members; whether the re-examination took place; and with what result?

Sir K. Wood: On the outbreak of war, in view of the pressure on the time of all concerned, the procedure contemplated by my predecessor was abandoned. Subsequently, however, on August 13th last, I gave an undertaking to see, before the next Finance Bill, whether I could not get the parties together and try and get some reasonable solution of the matter, and my hon. Friend is, I think, aware of the recent developments in this connection.

Mr. Keeling: Is the Chancellor aware that the only parties consulted were the vendors, who are not the only parties interested in the matter? Does he think it right that the Government should have violated this expressed policy without any word of explanation?

Sir K. Wood: I think that the procedure which is now in operation is the best. Obviously we cannot have a long inquiry, but I understand that my right hon. Friend the Minister of Health is in touch with all the parties who are interested in the matter.

Viscountess Astor: Is it not true that the advertisement of patent medicines was one of the scandals which was dealt with in the last war? No one knows why the Government have given in on this question.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 5th.—Meeting of the Central Division, N.V.M.A., at the Conway Hall, Red Lion Square, W.C.1, 3 p.m.

June 6th.—**Special Meeting of Council, N.V.M.A.**, at 28, Lichfield Street, Tamworth, Staffs, 2.30 p.m.

June 6th.—Meeting of the South Wales Division, N.V.M.A., at Bridgend, 2.15 p.m.

June 9th.—D.V.S.M. Examination at Glasgow Veterinary College.

June 19th.—Meeting of the N.V.M.A. Finance and General Purposes Committee, Royal Station Hotel, York, 2.30 p.m.

June 19th.—R.C.V.S. Committee Meetings, Royal Station Hotel, York.

June 20th.—R.C.V.S. Annual General Meeting, Royal Station Hotel, York, 12 noon.

June 20th.—R.C.V.S. Committee and Council Meetings, Royal Station Hotel, York.

June 20th.—Victoria Veterinary Benevolent Fund Annual General Meeting, Royal Station Hotel, York, 12.30 p.m.

June 26th.—R.C.V.S. Written Examination begins.

June 30th.—R.C.V.S. Oral and Practical Examination begins.

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The Control of Diseases of Farm Livestock

A further meeting was held at the headquarters of the National Farmers' Union on Tuesday, May 27th, 1941, between representatives of the Union, of the National Veterinary Medical Association, and of the Animal Health Division of the Ministry of Agriculture and Fisheries, at which schemes for the control of the diseases of dairy cattle were discussed.

We understand that provisional agreement has been arrived at as to the services to be rendered by the veterinary profession and the fees to be paid for such services by the farmer: an agreement which will be put before the Council of the National Veterinary Medical Association at a special meeting called for June 6th, at Tamworth, at 2.30 p.m., and thereafter to be submitted to Divisions of the N.V.M.A. for their consideration and, it is hoped, approval.

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ROYAL COLLEGE OF VETERINARY SURGEONS

Central Library for Animal Diseases

We regret to report that as a result of the raid on London on May 10th, considerable additional damage has been done to No. 10, Red Lion Square. An incendiary bomb fell on the roof and burned through to the main timbers. There was difficulty in getting an adequate water supply in the Square, but the fire was put out before it could spread very far.

The result is, however, that the Library and Council Room have been considerably damaged, mainly by water. Many of the more valuable books had already been removed, but of those that remained, a large number have been ruined, being either charred or damaged by water. They will be got away as soon as possible, but in the meantime it has been found necessary to discontinue the Library service. Members are, therefore, requested not to apply for the loan of books from the Library until further notice.

PETROL RATIONING SCHEME

Alteration in Southern Areas of Administration

The attention of those of our readers who will be affected thereby is directed to the following information contained in a notification of certain alterations in areas of administration, recently received from the Petroleum Department, the application of which commences in association with the ration period July-August.

Certain alterations it has been agreed to make in the boundaries of the Civil Defence Regions covering the south of England will affect the areas of administration of the Petrol Rationing Scheme which are coterminous with Civil Defence Regions and as from the date of the change-over it will be necessary for applications for petrol ration coupons from residents in the areas involved to be made to a different Divisional Petroleum Office.

The alterations to be made are as follows:—

(*a*) The transfer of that part of the county of Dorset at present in the South Western Region to the Southern Region.

(*b*) The transfer from the Southern Region of that part of the county of Surrey not included in the London Region to the South Eastern Region.

The effect of (*a*) will be that as soon as practicable after the change is put into operation the Divisional Petroleum Officer at Reading will deal with applications from persons resident in any part of Dorset, many of whom formerly applied to Bristol, and as a result of (*b*) persons resident in that part of Surrey outside the Metropolitan Police Area and who were formerly dealt with at Reading will be required to apply to the Divisional Petroleum Officer, Tunbridge Wells.

Divisional Petroleum Officers have been requested to communicate details of the change-over to all Liaison Officers with whom they are in contact and a notification together with a gummed label bearing the new Divisional Petroleum Officer's address will be forwarded to all veterinary surgeons affected.

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WEYBRIDGE TUBERCULIN: MINISTER'S CONCESSIONS

Representatives of Milk Producers' Associations and Cattle Societies recently waited on the Minister of Agriculture in reference to the difficulties that have arisen following the introduction of the Weybridge tuberculin.

The Minister has promised that the present practice of the interpretation of the Weybridge tuberculin tests will be discontinued at an early date and the work is to be decentralised.

Mr. Hudson has also undertaken that no further change in the tuberculin to be used should be made without previous announcement to the interests concerned.

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LIVESTOCK DISEASE CONTROL: SCOTTISH COMMENT ON THE SURVEY COMMITTEE'S REPORT

Devoting its leading article to the N.V.M.A. Report on Diseases of Farm Livestock (Section I), of which it publishes a full summary, *The Scottish Farmer* of May 17th underlines the Association's own contentions in the following terms: "Animal diseases exact a toll upon the nation's food supply which can be ill spared, especially in time of war, and in the interests of increasing the food supply a campaign against animal disease is every bit as necessary as the ploughing-up campaign, the dig for victory campaign, or the anti-rat, anti-rabbit and anti-waste campaigns. The veterinary profession has the knowledge which would make possible the control of many of the animal diseases; but unfortunately there has been little indication so far of any organised effort to apply the knowledge available."

The Report represents the endeavour of the N.V.M.A. to promote such organised effort, and concerning it, *The Scottish Farmer* says: "The Report gives a striking idea of how vast must be the losses sustained each year by the farmers and by the nation through livestock diseases. Whether the Survey Committee of the N.V.M.A.

estimates the annual monetary loss suffered by the nation 'as a result of mastitis, contagious abortion, sterility and Johne's disease alone' at not less than £15,000,000 sterling as mentioned on page 5 and on page 10 of their Report; or puts the estimated monetary loss from mastitis, contagious abortion and sterility alone at the 'conservative figure' of £17,700,000 as on page 13; or considers that a more accurate estimate of the annual loss from the four diseases mentioned would be £20,000,000 as also stated on page 13, it indicates that whichever of the estimates we accept, the losses due to all animal diseases must be enormous; for the figures given refer only to the effects of the diseases mentioned upon a section of the cattle of the country.

"There are other cattle diseases such as tuberculosis and foot-and-mouth disease; there are diseases of sheep and pigs which cause heavy losses each year; also poultry diseases; and among horses there is that fatal malady known as 'grass sickness,' the cause of which is not known and for which no remedy has so far been discovered. Even if we put the extent of the losses due to the four diseases mentioned in the N.V.M.A. Report at the lowest of the figures just quoted, namely, £15,000,000, it must be evident that the total loss from disease among all classes of livestock must be far in excess of the estimate of £19,000,000 in the Report of the Committee on Veterinary Education published about three years ago.

"The N.V.M.A. Survey Committee has prepared two separate but related policies for the control of animal diseases, policies which it is believed are capable of immediate application even under war-time conditions—(*a*) A short-term policy dealing with disease control problems requiring urgent solution, and likely to yield immediate benefits; and (*b*) a long-term policy for the future. These are being discussed with farmers' organisations and with the Ministry of Agriculture with the object of reaching agreement as to the extent to which they may be put into operation and the methods whereby this could best be done.

"No one connected with the livestock industry would deny the seriousness of the position or the need for an organised campaign against the diseases which cause such enormous losses to the nation, direct through the death of animals and indirect through the lowering of their productivity; and it is hoped that a scheme on the lines suggested by the N.V.M.A. Committee will be found acceptable to the livestock industry. Meanwhile, a great deal might be done to minimise the losses from disease if the owners of livestock would make it their practice to call in veterinary advice immediately they see signs of ill-health or unthriftiness among their animals in order that disease, if present, may be diagnosed at an early stage and promptly treated; or better still, arrange for the regular veterinary inspection of the animals at yearly or more frequent intervals. This would enable diseased animals to be weeded out at an early stage, when the carcase would have a fairly substantial salvage value, and before the disease had the opportunity of spreading to other animals on the farm."

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HERD CLEAN-UP "A SOUND INVESTMENT FOR THE FARMER"

In the course of a contribution to a recent issue of *The Farmer and Stock-breeder*, a well-known Kentish farmer writes: "I am very glad to see that the farming community is at last taking heed of the great efforts made by the National Veterinary Medical Association to devise a method of dealing with those all-too-well-known diseases: mastitis, contagious abortion, sterility and Johne's disease. Every dairy farmer must be aware of the advantages this scheme would bring. To obtain even a 50 per cent. decrease of these diseases at the proposed cost of 10s. per head per annum would at least be a sound investment for the farmer. Apart from this, there is the national aspect. At a time when we need every gallon of milk we can produce, surely this is the moment to begin cleaning up our herds to make them as efficient as possible.

"I quite realise that there are some points for discussion, such as the extent of the scheme and its method of administration, but these could be quickly overcome by close co-operation of the N.V.M.A., N.F.U. and B.D.F.A.

"This is a scheme which would benefit the whole nation, and it is the duty of the Minister of Agriculture to see that it comes into force as quickly as possible. To that end, he should call a conference of the bodies concerned as the quickest means of reaching agreement."

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CATTLE DISEASE AND MAN

Under the above heading *The Medical Officer* of April 19th observes: "The first section of a Report on Diseases of Farm Livestock, prepared by a survey committee of the National Veterinary Medical Association of Great Britain and Ireland, deals with some diseases of cattle and has many points of interest to practitioners of human medicine.

"Our first concern with animal diseases is the liability of their infecting man, but veterinary medicine has other interests for us, to which we shall briefly refer. The veterinary field allows of the study of disease in circumstances which are not artificial as are those of laboratory, and is not restricted by considerations of human sociology, which embarrass the study of disease in man. Not only are the veterinarian's patients at large in their natural habitat, but the diseases from which they suffer are natural to them. In these particulars veterinary and human practice are similar, but they differ in that the business of veterinary medicine is purely financial. By this we do not mean that it is inhuman, for this is very far from the case, but generally the farmer calls in the surgeon to save monetary loss, so the success of treatment can be measured in terms of money, and the cost of disease determined in a way which is not possible in man. Again, parasites which are common to man and animals do not produce similar diseases in dissimilar hosts. *Brucella abortus* gives undulant fever in man and epidemic abortion in cattle. The reactions have little in common. The parasite is apparently naturally established in cattle, but at present it is adventitious in man. Possibly in course of time it may become habitual to man. If it is doing so, the reaction of man will tend to resemble that of its normal host. This may help us to decide whether such a disease as undulant fever is likely to become epidemic in man.

"The diseases with which the pamphlet deals are: mastitis, contagious abortion, Johne's disease, and some venereal diseases. *Mycobacterium paratuberculosis*, which causes Johne's disease, is not known to be parasitic upon man, so has no direct interest for us. Nor is any venereal infection common to man and other animals, but owing to the obscurity of the evolution of human venereal diseases, the study of those of animals may prove to be enlightening.

"Mastitis in cows is, however, of direct and great interest to human pathology. It has no connection with human mastitis, but has direct concern with human epidemic sore throats. The most frequent parasite of bovine mastitis is *Streptococcus agalactiae*, which is not parasitic upon man, but the udders of cows occasionally become infected with types of *Streptococcus pyogenes*, which are exceedingly dangerous to man. Infection of cows is probably always derived from a human source. We are not sure if these streptococci do of themselves produce mastitis in cows, but we are certain that they are not infrequently recovered from the udders of cows, both diseased and healthy, and have set up severe epidemics of human disease, the best known of which is the Brighton epidemic. In investigating milk-borne epidemics it is therefore necessary to attend to the udders of the cows supplying the suspected milk. As mastitis is very frequent it is likely that some cows with mastitis will be detected, but they may not be the culprits. Cows with healthy udders may be infecting their milk with streptococci dangerous to man; cows with marked mastitis will give pathological milk, but it may not be dangerous to man.

"Another cause of mastitis is *Corynebacterium pyogenes*. This is not the diphtheria germ, though it is morpho-

logically similar and not much different culturally. It is not pathogenic to man. Outbreaks of diphtheria are occasionally spread by milk. Many that have been reported will not stand investigation, but some do. Inquiring into an outbreak may lead to the discovery of a corynebacterium from the udder of a cow supplying the milk, and lead to a hasty and erroneous conclusion that this explains the outbreak. This has occurred in the past and may occur again unless the rule is followed that a corynebacterium recovered from anywhere but a human pharynx is held to be innocent until its virulence has been proved."

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FOOT-AND-MOUTH DISEASE

Over the week-end outbreaks of foot-and-mouth disease among cattle were confirmed at Closeburn, Dumfries, and Johnstone Bridge, in the county of Dumfries, Ayr and Stewarton, Ayrshire; Uplawmoor, Castle Semple and Bridge of Weir, Renfrewshire; Ormston, Pilling, Cleveleys and Rawtenstall, Lancs; and Peak Forest, Derby.

Following the outbreak of foot-and-mouth disease in Yorkshire, reported in our last issue, and the subsequent confirmation of cases in Scotland, the Minister of Agriculture and Fisheries has made an Order applying the provisions of the Foot-and-Mouth Disease (Controlled Areas Restrictions) General Order of 1938 to those parts of England and Scotland lying between a line drawn from the Wash along the southern boundaries of Lincolnshire, Nottinghamshire, Derbyshire and Cheshire to the mouth of the River Dee, and a line drawn from the Firth of Clyde along the north western boundaries of Dumbartonshire, Perthshire and Aberdeenshire to the North Sea. The Order is designed to control the movement of animals into, within and out of the area, and provides that only markets and sales of fatstock for immediate slaughter which are licensed by the local authority shall be held in such area.

In their announcement the Ministry state: "The Order has been made as a precautionary measure for the purpose of preventing the spread of disease to other parts of Great Britain. It has been necessitated by the fear that animals exposed in a number of markets have been brought into contact with infection during such exposure and, therefore, may carry the disease to many widely separated places. The Order does not apply to those parts of England and Scotland which are already subject to Infected Area Restrictions. It is hoped that these measures will be effective and that it will not be necessary to keep them in operation for any lengthy period."

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HUNTERIAN COLLECTION LOSSES

Recent enemy action has inflicted grievous damage upon the world-renowned museum of the Royal College of Surgeons, particularly in respect of the Hunterian Collection. In spite of great damage to the interior the fabric of the college in Lincoln's Inn Fields is more or less intact, but the museum buildings have suffered severely.

The most valuable specimens in Dr. John Hunter's collection, purchased by the Government for £15,000 two years after his death in 1793 and presented to the college, are probably safe under the débris, having previously been moved into reinforced sections of the sub-basement. But thousands of museum pieces are gone, among them the skeletons of kangaroos brought by Captain Cook from Australia, and the comparative osteology collection of 4,000 specimens acknowledged to be the finest in the world. Much of the material ante-dated British Museum specimens and the greater part of the wonderful work of Sir Richard Owen and Dr. William Flower has been undone.

All Dr. Hunter's eighteenth-century furniture, which was in the President's room, was destroyed. The original surgical instruments used by Lister were recovered, but many others were lost. Though the oldest mummy in the world, that of Ra Nefer, an Egyptian nobleman who died, it is said, about 2900 B.C., was destroyed, many mummies of popular interest have been salved including the skeleton of the Irish giant (8 ft.), the Sicilian dwarf (20 in.), Jonathan Wild, and Eugene Aram. The bones of Queen Berengaria, Richard Lion Heart's consort, who died in 1230, were among hundreds of treasured specimens.

By a grim coincidence the invaluable Army Medical War Collection, containing plaster casts of every type of wound, was also destroyed, as were the council room and lecture theatre.

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R.C.V.S. ANIMAL MANAGEMENT EXAMINATION

(*May*, 1941)

List of Successful Candidates

(*Continued from page* 302).

Dublin:

Ahluwalia, C. S.
Barron, J. M.
Buckley, A. R.
Clark, A. R. L.
Craig, S. A. (credit).
Craigie, G.
Earnshaw, R. E. (credit).
English, P. J. M.
Fox, N. R.
Kelly, B. O.
McAulfield, R.
McGrenra, D. P.
Menton, B.
Molloy, E. P.
O'Brien, W. B.
O'Moore, L. B. S.
Power, P. N.
Russell, F. W.
Sheahan, Miss M.

Liverpool:

Adams, A. D.
Done, J. T.
Fox, H. J.
Hall, C. A.
Hewitt, S. L.
Hillis, Miss J.
Hughes, A. L.
Humphreys, J. R.
Kay, R. S.
Littlejohn, Miss A. I.
Maddocks, J. T.
Miller, P. G.
Miscampbell, K. I.
Pinsent, P. J. N. (credit).
Roberts, T. O.
Robinson, Peter (credit).
Thurmand, R. L.

Edinburgh:

Chambers, T. A. M.
Comrie, Ian.
Cran, Wm.
Davie, John.
Dawson, F. T. L. M.
Edgar, James.
Field, John.
Gunstone, J. W.
Hamilton, H. A.
Johari, M. D.
Latimer, G. E. M.
Letham, John.
Maconkey, W. I.
Moody, F. C.
Murray, M. D.
Parameswaran, K.
Oxley, Henry.
Snodgrass, Nigel.
Stewart, Alex.
Stewart, James.
Temiyachol, P.
Thomas, P. D. I.
Walker, I. A.

(*To be continued.*)

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WASTE FOOD BOARD

The Minister of Supply, in consultation with the Secretary of State for Scotland, the Minister of Agriculture, and the Minister of Food, has set up a Waste Food Board to provide for the better utilisation of kitchen waste for pig and poultry feeding.

The Board, which consists of Mr. R. C. Morrison, M.P. (Chairman), Major A. C. Bonsor, Miss Megan Lloyd George, M.P., and Lieutenant-Colonel G. P. Pollitt, will form part of the salvage organisation of the Ministry of Supply. It will arrange for the erection of additional plants for concentrating or boiling the material, and will provide for extending the collection of kitchen waste for use in these plants.

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EXPORT OF PEDIGREE STOCK

The proposal for the establishment of a Livestock Export Group to act in co-operation with the Board of Trade in promoting improved facilities for the export of pedigree livestock, to which we referred in a recent issue, is the outcome of an effort to overcome such handicaps to export business as the closing of the quarantine station.

Commenting on the situation, *The Farmer and Stock-breeder* observes: "When an importing country stipulates for a quarantine period the difficulties are so great as to be almost insuperable, and the report (of the Shorthorn Society on the issue of export certificates) points out that the 21 days' notice involved is almost an impossible one in the present emergency. But the Society has found that the Ministry of Agriculture is prepared to find and supervise the quarantine facilities, exporters bearing the costs.

"Given such a helpful lead by the Ministry as a beginning, it is to be hoped that a workable scheme will be evolved. The transport of pedigree animals is outwards, and so does not compete for shipping space with the necessary war imports. The export trade is a matter of concern to the pedigree industry, and it is also providing some national service.

"The livestock export trade may not be a matter of large financial influence, but it does help to adjust the balance of exchange, and is worth while in these times on this ground alone. But there are other aspects. Especially after this war will it be necessary to preserve the nucleus of a pedigree business that will be of greater importance generally.

"Further, the export trade supplies a spur with which the pedigree breeder may prick the sides of his intent, improved stock. But the incentive also provides better material for the commercial breeders at home and reacts to the advantage of an important and, indeed, unique side of our farming industry."

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THE LOCAL APPLICATION OF SULPHONAMIDES

Intraperitoneal Administration following Abdominal Surgery

Increasing interest has recently been taken in the abdominal surgery of the bovine, both for the relief of certain obstetrical conditions and for the performance of rumenotomy. A serious complication which sometimes occurs in these cases is a slowly spreading peritonitis which, if fatal, usually causes death in five to ten days. The same type of peritonitis with a fatal termination may occur following severe uterine infection.

In view of these facts the results of Hudson, Selbie and Smith[1] are of considerable interest. A study of acute intestinal obstruction in the human subject led to the conclusion that death following resection of the gut was usually due to a slowly spreading plastic peritonitis caused by *B. coli* infection. This condition could be reproduced in the rabbit by injecting intestinal contents into the abdomen or by operative procedures. A dose, per kg. body weight, of 300 mg. of sulphanilamide suspended in saline and administered intraperitoneally was well tolerated by rabbits and caused no inflammatory reaction. If this dose was administered intraperitoneally at the time the peritoneal cavity was contaminated with intestinal contents it produced a markedly beneficial effect, but the same dose produced no such effect when given orally. In the treatment of a fulminating infection of the peritoneum, however, this dose of sulphanilamide administered intraperitoneally was valueless. The intraperitoneal administration of a corresponding dose to human subjects following operation has given promising results although oral administration has been disappointing.

It is pointed out in an annotation commenting on this work[2] that it would have been well to investigate also the results of giving repeated doses by mouth sufficient to keep the blood concentration at an effective level for a longer period. The abundance of recent work, however, supporting the local application of sulphonamides in infective conditions suggests that the intraperitoneal route is fundamentally sound.

(1) *Lancet* (1941), i, 438, April 5th.
(2) *Ibid.* (1941), i, 576, May 3rd.

The dose in the rabbit corresponds to a dose of approximately 5 oz. in a 1,000 lb. cow and the intraperitoneal injection of this dose suspended in saline would be quite feasible. It cannot be stated that this would be the correct dose or that smaller repeated doses might not be better, but it is suggested that the intraperitoneal administration of sulphanilamide would further increase the safety of bovine abdominal surgery and also prevent death in some cases in which a severe uterine infection was commencing to invade the peritoneal cavity.

The suggestion in the annotation, that the local application of sulphonamides is fundamentally sound also causes one to speculate on the possible value of udder infusion with sulphanilamide.

J. F.

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SAFE MILK IN WAR-TIME

On this subject the *British Medical Journal* observes: "On September 12th the Ministry of Information broadcast, in a News Bulletin, several items concerned with the preservation of the public health. It pointed out that the Government Health Services have, since the outbreak of war, given careful and constant consideration to the effects of such factors as troop movements and evacuation on the incidence of disease. In the years immediately preceding the war the Medical Research Council, acting on behalf of the Ministry of Health, had made plans for an Emergency Public Health Laboratory Service to increase the existing facilities for the rapid diagnosis and control of infectious disease, and this service was mobilised at the outbreak of hostilities. More recently the Ministry of Health has arranged for an immediate extension of the system of water chlorination, so that small as well as large supplies shall be given this highly effective protection against contamination. These and certain other precautionary measures that have been taken are, it will be noted, of a kind that can be fully implemented by the action of the central or local health authorities. In regard to milk the case is different. As the Ministry of Information points out, great care is taken to secure the cleanliness of our milk supplies, but there can be no doubt that in times like the present special dangers of infection may exist. Maximum protection against these dangers can be obtained by boiling all milk that has not been pasteurised or sterilised. The milk should be brought to the boil and then cooled quickly.

"This official acknowledgment that pasteurisation, or sterilisation, is the only method of providing safe milk for the population, and that, failing such treatment, the householder should protect himself, or herself, by boiling all milk before drinking it, will be welcomed by the medical profession in general, and in particular by this *Journal*, which has for many years pleaded for the compulsory pasteurisation of all milk sold for drinking purposes. It is greatly to the credit of the Government that they should have publicly emphasised the importance of this precaution at the present time. It would have been still more satisfactory had it been possible to announce that all milk sold to the public would be pasteurised; but it is understandable that the dominant claims of distribution may make this impracticable. The result, it will be noted, has been to shift to the consumer the onus of securing his own safety, and still more that of his family. He has been warned; but the warning is frankly '*caveat emptor*.' He must first ascertain whether the milk supplied to him has been sterilised or pasteurised. If it has not, he can try to shift his custom to a retailer who will supply him with safe milk. Failing this, he can render it safe himself at the cost of a little fuel and trouble.

"How many of the public heard the broadcast, or read the report of it in the lay press, we do not know. But it would, we fear, be optimistic to hope that the good intentions of the Government will come to full fruition without further assistance. That assistance the family practitioner can give more effectively than anyone else.

If he will call the attention of all his patients to the Government's pronouncement, and urge them to take the necessary steps to protect themselves against the very real dangers of milk-borne epidemics, he will be performing a service to the public health. He will find, among those who have given any thought to the matter at all, considerable misapprehension as to the nature of the risks involved. Tuberculosis derived from the cow is, perhaps, the most serious. It is certainly more serious than it was, now that large numbers of young children who were previously living in large urban areas, where almost all the milk was pasteurised, have been moved to rural areas where the retailer-producer holds sway and pasteurisation is at a minimum. But tuberculosis is by no means the only disease to be feared, nor is the cow the only sinner as a spreader of infection. Milk is an admirable culture medium, and from the time it leaves the cow's udder until the time it enters the human mouth it is liable to contamination by a host of handlers unless constant and adequate precautions are taken in regard to treatment and storage. The many records of milk-borne epidemics of tonsillitis, of scarlet fever, of typhoid and other intestinal infections, and so on, have provided ample evidence of the passage of infection by the route from man to milk and back to man again. It is one of the few routes that can quite certainly be stopped at the cost of a little trouble. Why not stop it?"

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THE ORIGIN OF ACTINOMYCOSIS

Referring to the subject of actinomycosis in the human subject, *The British Medical Journal* states: "There can be few who still accept the old idea that actinomycosis results from chewing straw or grain. This arose from a confusion between two plainly distinct micro-organisms, of which that found in grain, originally by Bostroem, has no claim whatever to be considered pathogenic for man. It is generally concluded that the infection is at least usually autogenous, and micro-organisms of this nature are known to exist in the mouth, tonsils, and lower bowel, but owing to technical difficulties they have not often been isolated from such sources and still less have they been adequately studied. H. R. Sullivan and N. E. Goldsworthy[1] report an attempt to isolate the organism from periodontal pockets in patients not suffering from actinomycosis; they were successful in five cases out of over one hundred, and in one other case they obtained a strain from a carious tooth. These six strains were carefully compared with others derived from actinomycotic lesions of the jaw, and in morphology, cultural characters, and fermentative reactions no difference between the two groups was observed. These authors frequently obtained a history of dental extraction immediately preceding the onset of actinomycosis of the jaw, and regard trauma as a frequent additional factor accounting for the onset of the disease in this situation. We recently[2] drew attention to Erikson's study of anaerobic *Actinomyces*, an important result of which has been to show that strains of human origin are antigenically quite distinct from those of bovine. This observation appears to sever any connection which may have been supposed to exist between the human disease and that occurring in cattle, and we would refer again to the proposal that the name *A. bovis* should be retained for the species found in cattle and *A. israeli* (or possibly *A. hominis*) for that peculiar to man."

(1) *J. Path. Bact.* (1940.) 51. 253.
(2) *British Medical Journal.* (1940.) 2. 90.

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NEW WEAPON AGAINST THREADWORM

A leading article in *The Lancet* supplies a commentary upon the use in the human subject of a drug which, as our own pages commonly bear witness, has come into prominence in the treatment of worm infestations in the domesticated animals.

"The patient infected with worms (or possessed with devils) shares with royalty and editors the privilege of using the first person plural. A few enter into voluntary symbiotic relationship with their worms (tapeworms in this case) on the understanding that the hostess shall preserve her sylph-like figure irrespective of dietetic excesses. Patients in general, however, are only too anxious to be rid of their parasites. Even though worms in the alimentary tract may cause no symptoms, their periodic appearance in the stools tends to produce depression and a sense of inferiority. So troublesome, indeed, are these minor psychological accompaniments of infestation that many doctors must have wished that their patients never looked behind them.

In this country cases of threadworm are common and tapeworms and roundworms occasionally met with; but helminthiasis is a minor problem to the average general practitioner. Nevertheless, the majority of the human race are infested with worms;[1] and while many of these infections are relatively benign there are others—such as bilharziasis and ankylostomiasis—which exact an enormous toll in terms of human morbidity. It is estimated that 500 million people suffer from hookworm disease, and workers who report on new remedies usually base their conclusions on thousands or even hundreds of thousands of cases. Even primitive man had a propensity for discovering suitable remedies for worm infestation. These vegetable drugs were employed empirically, and probably the bulk of them were useless; but the valuable ones were handed down to later civilisation. Theophrastus in the fourth century B.C. thought highly of male fern. *Artemisia anthelminthicum*, from which we obtain santonin, was well known to the Greeks and Romans and was freely employed therapeutically by the Arabian physicians of the Middle Ages.[2] In his de Lamar lectures (1927-28), M. C. Hall made a notable contribution to the study and evaluation of anthelminthics, and during the past decade much work has been done with the objects of evaluating existing remedies and synthesising new drugs. Anthelminthics synthesised for use in this country have, with few exceptions, been intended for the treatment of threadworm infection. Sir Robert Hutchison regards the presence of threadworms not as a disease *per se* but as a pointer to an unhealthy state of the bowel characterised by excessive secretion of mucus, and recommends that the amount of carbohydrate in the diet should be reduced. Thereafter the mere mechanical removal of the worms from the lower bowel by means of simple enemata usually suffices if care is taken to prevent reinfection. Adults, on the other hand, often prove intractable, and not infrequently they run through the whole list of treatments, from simple enemata to quassia, turpentine, hexylresorcinol and Butolan, and may suffer the final indignity of an appendicostomy for colonic lavage. This wide choice of therapeutic agents speaks for itself; a completely satisfactory anthelminthic for threadworm infection has still to be found.

The latest drug to be recommended for this condition is phenothiazine. Prepared by Bernthsen nearly half a century ago, it has been on the shelf until recently; but it can claim distant relationship with sulphanilamide, and perhaps this prompted pharmacologists to take it down and have another look at it. It thus has an unimpeachable pedigree, and can also boast several therapeutic feathers in its cap. In 1935, Smith, Munger, and Siegler[3] showed that it is a powerful insecticide likely to prove of first importance in agriculture; de Eds and his colleagues[4] have demonstrated that phenothiazine is a valuable urinary antiseptic; in veterinary practice it has established itself as an anthelminthic for cattle, sheep, swine and horses, with a low toxicity for the host. Trials

(1) Clark, A. J., Applied Pharmacology, London. (1940.) p. 353.
(2) Findlay, G. M., Recent Advances in Chemotherapy, London. (1939.) p. 10.
(3) Smith, L. E., Munger, F. G., and Siegler, E. H. *J. econ. Ent.* (1935.) 28. 727.
(4) De Eds, F., Stockton, A. B., and Thomas, J. O. *J. Pharmacol.* (1939.) 65. 353.

are now being made on man. Opportunities to test its effects on the different kinds of helminthiasis are happily limited in England; the series reported by Dr. Manson-Bahr in *The Lancet* of December 28th is thus necessarily small, but this is offset by the fact that many of the patients had multiple infections. It appears that worms in the small intestine are unaffected by the drug. But if phenothiazine acts as a urinary antiseptic only in an acid urine, it may yet be found to act more successfully as an anthelminthic in the small bowel if measures are taken to lower the *p*H of the intestinal contents during treatment. On existing evidence, however, phenothiazine does not improve on existing remedies against hookworm disease. Similarly, little is to be expected from it in whipworm infections. Manson-Bahr's experience of the drug as a remedy against threadworms is more promising. The ideal anthelminthic would be one which, given by mouth for a few days, would completely eliminate the parasites. In threadworm infection, however, it is not enough to say that a new drug clears up the ordinary case; the real question is whether it will cure cases proved resistant to the measures in common use. Only further experience will decide whether this can be said of phenothiazine.

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A suggestion that redistribution and not reduction of livestock was needed was made by Mr. R. V. Bradburn at a meeting of Shropshire F.U. When farmers had pedigree stock for which they could not provide, he thought such stock should be kept by a man who was in a position to do so.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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"A KEY POSITION IN AGRICULTURAL RESEARCH"

To the Editor of the Veterinary Record

Sir,—Though not a veterinarian, I am, nevertheless, sufficiently associated with veterinary affairs, as a member of the governing body of a veterinary college, to wish to ally myself with the profession when its interests are, or seem to be, affected.

When a short time ago I read of the appointment of a new Secretary to the Agricultural Research Council I waited for evidence of some lively reaction on the part of those whose duty it is to give public expression to the considered views of the profession as an organised body. I took it for granted that all veterinarians realise that the A.R.C. is, above all others, that body which is shaping policies that, in their developments, must inevitably affect the private and public life of everyone among them; which is determining the rate and the direction of all movements in veterinary education and research in this country; and that any election to the A.R.C., and especially the appointment to its Secretaryship, must be a matter of the greatest concern.

I waited in vain. Apparently veterinarians generally either think that the A.R.C. is just another of the many committees which are invented by the State in order that men may be attracted away from their real work and the march of science thus slowed down, or else they are content to subscribe to the view that their own ranks do not include such as possess that knowledge and wisdom rightly required of those who advise Government departments on matters of policy relating to livestock production: an attitude which may, of course, be justified.

It is becoming somewhat difficult to avoid the conclusion that the ambitious, entering the fields of politics, agriculture, or veterinary science, would be well advised to equip themselves in advance with a degree in medicine. One begins to wonder whether the higher I.Q's avoid veterinary science and are attracted to medicine; whether the medical curriculum is indeed so much better an educational instrument than the veterinary; what there is in medical education that so equips a man that he can, with relative ease and amazing rapidity, master the complexities of specialisms such as agricultural economics, animal and plant breeding, nutrition, disease, and the like, to the structure of which he himself has made no personal contribution. It certainly would seem to be the case that in our own society a medical degree is the key that opens most of the doors of opportunity, or should it be said, the tool that picks most of the locks? Whilst the medical profession can and does supply any number of policy-makers and expert advisers of Government and other departments on almost any subject under the sun, the veterinarians are not even in charge of the social destiny of their own profession. They are heavily outnumbered by medicals on the A.R.C. (the new Secretary is a reinforcement to the medical block), and they seem to have failed to have formed any real alliance with the agricultural scientists whose interests, together with their own, are now so thoroughly dominated by men who belong to neither of these professions.

That a medical, rather than a veterinarian, has been appointed to this key position in agricultural research in this country is due simply and solely to the fact that in the considered opinion of those responsible for the appointment there was no veterinarian who could reasonably be regarded as suitable. Let there be no misunderstanding. Had there been a veterinarian with claims that could not be disregarded he would surely have been elected, and until there are such in the veterinary schools and research institutions the profession will continue to be inadequately represented on such bodies as the A.R.C., and social prizes of the magnitude of the secretaryship of this body will continue to be monopolised by medicals.

Disappointment should provoke the profession to enquire into the causes of the apparent dearth of first-class men in its ranks. It will be agreed that if veterinary science is to advance and if veterinarians are to claim their rightful place in our society, a fair proportion of first-class men must enter the schools; that the teaching mechanism to which these are exposed must be of the very best design; and that a career in veterinary science must be such as can promise limitless opportunities for complete personal, professional and social development.

In my view there is nothing very much wrong with the quality of the incoming student nor with the career that veterinary science now proffers, but there is very much that is wrong with the schools and with the present policies elaborated by the leaders of the profession.

It is urgently necessary, in my opinion, to strengthen the teaching staffs of the colleges, to modify the curriculum, to raise the standards, and, above all else, to encourage the development of the research spirit among the junior staff. The students should be living in an atmosphere of eager enquiry throughout the whole of their undergraduate lives.

If the present teachers in veterinary colleges, being given the facilities, cannot produce those physiologists, bacteriologists, biochemists, and the rest of the specialists which the community needs, then we may expect to see this appointment of a medical man to the Secretaryship of the A.R.C. followed by the appointment of non-veterinarians to chairs in veterinary colleges, or, alternatively, by the shutting down of the non-clinical departments of the veterinary colleges, the students being transferred to the corresponding departments of a medical school.

Yours faithfully,

F. A. E. Crew.

May 19th, 1941.

THE CONTROL AND TREATMENT OF TEMPORARY INFERTILITY IN THE MILCH COW AND HEIFER

To the Editor of the Veterinary Record

Sir,—The Survey Committee of the "National" is to be congratulated on its "Recommendations" on the above subject, published as a supplement to *The Veterinary Record* of May 10th: and those not already familiar with the technique of uterine irrigation should not experience much difficulty if they follow the very simple and concise directions given.

If the cervix is well retracted, very little difficulty should be experienced in the vast majority of cases, in passing the uterine catheter, and I prefer a fine catheter to a thick one. What one has to imagine is that the cervix before retraction is like the letter "S," and that by retracting it, you make this into the letter "I." In cases where resistance is encountered in passing the catheter, no attempts at force must be made. In short, there is no risk of perforating cervix or uterus, provided that when resistance is encountered, no forcible measures are adopted to overcome it. Under no circumstances should attempts be made to dilate the cervical canal of a heifer which has never been pregnant.

It is easier to insert the catheter at the time of oestrus, or within five days of its cessation, and it will be found to be the safest policy in cases where resistance is met with, to delay injection until then. At the same time, it is best to examine the uterus when oestrus is absent, and so differentiate between a natural uterine engorgement when it is present, and the engorgement which is indicative of endometritis.

If difficulty is experienced in passing the catheter into each horn, it suffices to start injection directly the catheter has passed the internal os. This practice should be adhered to in the case of a uterus which has never been pregnant. The "cocked" tail is a sure indication that the operation has been carried out correctly. A few animals do show signs of discomfort following the injection, but as a rule this rapidly passes off, and the animal's "mind" can be distracted by turning her out directly it is finished.

It is gratifying to note that it is emphasised that strong solutions of iodine should not be used. The only permissible departure from this rule is in obstinate cases of pyometra: and only in such cases or where there is a certain amount of discharge should any attempt be made to siphon the injection out. Let it remain in, for the uterus as it reacts will expel it. In mild degrees of endometritis one injection often suffices, but if present to an appreciable degree the treatment should be repeated in seven to ten days. As to service after treatment, I never advise it to be permitted until three weeks later. Further, as it is found that not a few if served then do not hold, but will at the next oestrus, I advise that the first oestrus be missed, whether it occurs in seven days or not until three weeks or more later. If such an animal fails to hold after two services, treatment should be repeated.

In connection with locating the ovaries, the left one is usually found more or less "tucked in" and lying on the side of the pelvic brim. The right ovary is found in advance of the brim.

As regards the diagnosis of salpingitis, if the Fallopian tubes are discernible they can be regarded as abnormal, and discretion should be used in advising treatment.

In maiden heifers which do not hold to service, and in the absence of clinical evidence of disease, but with oestrus occurring at an interval of three or six weeks, more consistent results will follow the intramuscular injection of wheat germ oil than by the "simple expression of the corpus luteum"—for often one wants to "preserve" and not "express" it in these cases. Where possible, three injections should be made before service and three afterwards, allowing an interval of seven days between each injection. The conclusions which I arrived at as to the use of wheat germ oil, and published in *The Veterinary Journal* in September, 1933, have not been modified or added to since then in the light of subsequent experience.

The Committee quite rightly point out that the absence of a uterine seal in the bovine does not negative the possibility of pregnancy. It is not infrequently absent when pregnancy is well advanced, and little difficulty is experienced in inserting the catheter through the entire length of the cervical canal: but in its absence, if, after applying the retractor forceps, the uterus appears to hang like a dead weight and resists retraction, the attempt must be discontinued at once and resort made to rectal examination. In case of doubt, postpone a final decision until a further examination in three weeks.

One is pleased to observe that Trichomonad infection is now accepted as a cause of infertility, for it is not so many years ago that Continental colleagues who asserted that it was were treated with derision, and it was solemnly stated in one standard German work that these protozoa were not found in the genital tract of domestic animals; the credit for first drawing attention to it is, I believe, due to Riedmueller, who published it in *Zbl. Bakt.* (Abt. 1, Orig. Bd. cvlll) in 1928.

In this country, Gould was the first to publish an accurate description of the disease as encountered here. Extensive field work was carried out in the province of Upper Bavaria in 1937-38 by an ambulatory clinic working under the direction of Professor Abelein, of the Veterinary Faculty of the University of Munich. In combating outbreaks, the following procedure was adopted:—

Breeding operations stopped at once, in order to combine curative and preventive treatment. The herd was sorted into:—

(*a*) Non-infected cows and virgin heifers.
(*b*) Positively pregnant cows.
(*c*) Infected cows, those with pyometra or other symptoms of the disease, and the infected sire or sires.

In (*a*) after careful examination service was proceeded with by a bull declared free of the disease.

In (*b*) kept under observation for potential pyometra cases.

In (*c*) curative treatment was carried out.

For the curative treatment I prefer iodine solutions (100 c.c. of a 1 per cent. solution of iodine in potassium iodide). In cases of pyometra, the treatment should start with the enucleation of the corpus luteum. As soon as the purulent content starts to discharge, the vagina to be douched out twice a day for three or four days, until there is an appreciable slackening in the discharge, with a solution of Entozon 1:3,000.* The treatment should be *completed* by the intra-uterine injection of the iodine solution given.

Yours faithfully,
J. F. D. Tutt.

"Rothiemurchus,"
St. Cross,
Winchester.

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VETERINARY EDUCATION

To the Editor of the Veterinary Record

Sir,—In your editorial of May 17th it was stated that there are shortcomings in the present system of veterinary education, the remedies which you suggest being (*a*) post-graduate tuition on selected subjects and (*b*) total re-organisation of the curriculum.

We should like to point out that the curriculum was very thoroughly re-organised in 1932, and that private tuition would be entirely unnecessary if adequate facilities for the clinical teaching of farm practice were provided at the colleges. The most practical method of righting the situation is obviously to provide an establishment in the country where students can be taught large-animal practice by those best qualified to give instruction, namely,

the professors of the colleges. The chief objection would appear to be that such an institution would interfere with the livelihood of the neighbouring practitioners, but this is an obstacle which must be surmounted. Surely a suitable practice, or adjacent practices, could be purchased for this purpose. The position of the surrounding practitioners would then remain unchanged, whilst they would be enabled to avail themselves of the opportunities for consultations which are so much appreciated by their town colleagues.

We wish to deprecate very strongly any suggestion of curtailment of the Anatomy course, but a point very rightly stressed was the teaching of Animal Husbandry. This subject would benefit under this arrangement, as it could be taught under practical conditions, with the co-operation of the local farmers.

At this moment, when evacuation to the country has become so necessary, the ideal opportunity for such a scheme would seem to have arisen.

Yours faithfully,
LORNA H. H. PHILLIPS.
VERA C. N. HICKMAN.

Waldens,
Petworth Road,
Haslemere,
Surrey.
May 24th, 1941.

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THIS FIRING QUESTION: THE *VIA MEDIA*

TO THE EDITOR OF THE VETERINARY RECORD

Sir,—It is refreshing at a time when, as some consider, there is a plethora of dry-as-dust dissertations, that one Division of the N.V.M.A. has thrown open the arena for an old-time thrust and parry debate on the above question.

Mr. E. Brayley Reynolds' contribution to the discussion was a masterly effort and the use of brains in dealing with sprained tendons seems to have been accentuated by him. I am glad he brought up the question of Newmarket bandages: probably a more frequent use of these if scientifically adjusted would do away with the necessity of firing in many hunters and steeplechasers.

As it has a bearing on the question, although perhaps not quite analogous, and despite my strong objections to anything savouring of the egotistical, I would like to relate an experience of my own. When a youth I had the cartilage of my left knee luxated in a game of rugby football, having it in soap plaster for six weeks. A few years later I luxated it again when riding a high bicycle, and some 35 years ago I did it a third time. I consulted a local doctor and he advised me to go into St. Thomas's Hospital and have the cartilage removed. Instead of acting immediately on this advice I departed to Gorleston-on-Sea for a fortnight's holiday and went into the sea 16 times during the fortnight. When I was not swimming I was wading with my trousers rolled above my knees, helping my daughter to catch jelly fish. I came back to work and since that time the leg has never failed me, although I always wear a knee cap when dancing—which I still enjoy—and, of course, remove the knee cap when swimming: a remarkable tribute to the efficacy of salt water, at any rate in a ligament strain!

Yours sincerely,
G. MAYALL.

Bolton.

After considering the post-war position of agriculture, coupled with future policy, Hampshire F.U. Executive Committee has adopted a proposal that the National Farmers' Union be urged to appoint an agricultural economist of national standing.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT OF 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 30th April, 1941	21	24	14	1,963	—	—	15	40	21
Corresponding period in ...									
1940	31	37	1	31	—	1	4	170	108
1939	34	36	—	—	4	10	2	87	58
1938	43	46	7	942	1	1	3	23	23
Total 1st January to 30th April 1941	184	199	209	21,201	7	21	114	639	305
Corresponding period in									
1940	214	233	18	2,552	11	24	105	1,296	793
1939	338	362	29	4,357	25	52	142	492	305
1938	356	375	148	19,321	37	59	88	140	97

NOTE.—The figures for the current year are approximate only. §Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from tuberculosis, at at April 30th, 1941, was as follows:— ENGLAND 3,863 ... WALES 9,279 ... SCOTLAND 3,264 ... TOTAL (GREAT BRITAIN) 16,406